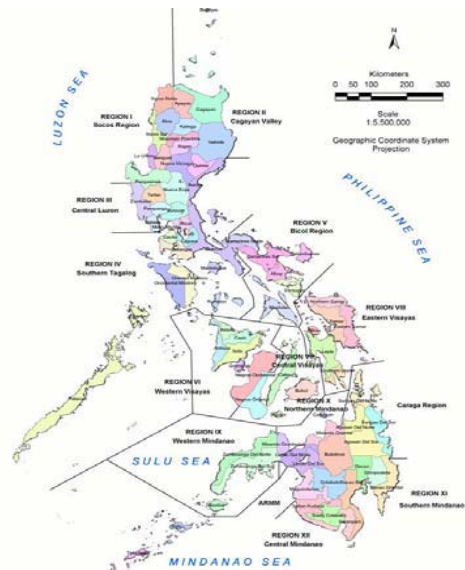


TOWARDS MAINSTREAMING DISASTER REDUCTION INTO THE PLANNING PROCESS FOR NATIONAL ROADS IN THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, PHILIPPINES

By

*Maria Catalina E. Cabral, PhD
Assistant Secretary for Planning
Department of Public Works and Highways, Philippines*

With the massive infrastructure development in the Philippines, prioritizing the road sector is certainly a necessity. The National Disaster Coordinating Council (NDCC) of the Philippines in partnership with the Department of Public Works and Highways (DPWH), the agency responsible for national road construction in the country applied for assistance with the Asian Disaster Preparedness Center (ADPC) with financial support from UN International Strategy for Disaster Reduction (UN/ISDR) through Swedish International Development Cooperation Agency (SIDA). Floods and earthquakes make the road system in the Philippines prone to landslides, road slips, embankment scouring and other sediment related disasters. Roads are often closed for several days when hit by such disasters causing disruption in transportation services that affects the access of passengers, goods and services. The impact of flooding and typhoons in creating havoc to the country's economy as well as to damage to property is recognized in the Medium Term Philippine Development Plan of 2004-2010 and accordingly the DPWH has also aligned its policies and strategies.



Priority Implementation Partnership (PIP) – a **Process** towards mainstreaming disaster risk reduction

Similar to other countries, the Road sector in the Philippines also works in close collaboration with various government departments like Planning, Finance, Environment and Local Government. While the development of national roads (30,000 km of length) is under the jurisdiction of DPWH, the remaining road network (172,000 km of length) falls under the concern of local government units. In addition, road projects are based on area development plans produced by the National Economic Development Agency (NEDA) and the Regional Development Councils (RDC). Similarly the feasibility reports prepared for each road project undergoes an environmental and a social impact assessment led by the Department of Environment and Natural Resources (DENR). In order to mainstream disaster risk reduction, further collaboration is required with NDCC and technical agencies responsible for producing hazard information related to natural disasters like the Philippines Institute of Volcanology and Seismology (PHIVOLCS), Philippines Atmospheric, Geophysical and Astronomical Services Administration (PAGASA).

A MULTI-AGENCY TECHNICAL WORKING GROUP TAKES THE LEAD

With this understanding, a technical working group was created amongst the multi-agency membership to steer the process of implementation of mainstreaming disaster risk reduction into the planning process of road construction.

Technical Working Group comprises

- Chairperson; Department of Public Works and Highways (DPWH)
- Vice-chairperson; National Disaster Coordinating Council

- Bureau of Research and Standards, DPWH
- Bureau of Design, DPWH
- Philippines Institute of Civil Engineers
- Department of Environment and Natural Resources
- Philippines Institute of Volcanology and Seismology
- Philippines Atmospheric, Geophysical and Astronomical Services Administration
- Asian Disaster Preparedness Center



The technical working group engaged in consultation and decided on the following activities for initiating mainstreaming. Since it was realized that the ultimate aim of mainstreaming could only be achieved by bringing change in the entire system, which road projects are developed, designed, constructed and maintained. Hence this particular partnership would emphasize on understanding the existing procedure of road planning and identifying the windows of opportunity to introduce disaster risk reduction.

The objectives are to :

- Review existing mechanism in carrying out risk assessment before construction of roads and bridges in DPWH.
- Suggest changes that will incorporate disaster risk reduction aspects.
- Initiate work towards institutionalizing the proposed changes.

Accordingly the scope of activities was detailed as follows:

- Documentation of existing procedure for development of road projects with respect to hazards;
- Documentation of contents of pre feasibility/ feasibility report of road projects in the country over the past 20 years;
- Analysis of past damage to road infrastructure within the past 10 years due to different natural hazards
- Identification of specific steps that can be taken for incorporating hazard considerations in project development and approval process;

Proposal on areas for review in the existing national structural codes and DPWH specifications for design standards of hazard resilient construction

- List of future priority projects for construction of roads in the Philippines.

In this paper, we refer to RISK as the expected degree of damage/loss due to a particular phenomenon and as a function of both the natural hazard and vulnerability.

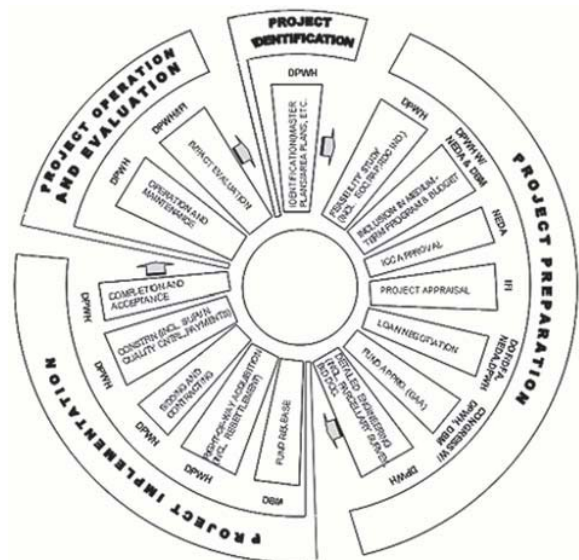
$$\text{RISK} = \text{function} (\text{hazard, vulnerability})$$

Vulnerability, on the other hand, refers to the susceptibility (opposite of resistance) or the degree of loss to a given element at risk. Element at risk refer to roads and bridges while Mainstreaming requires assessment of the implications of disaster's risk on an agency's planned development action from policy to its program implementation.

Disaster Risk Reduction (DRR) is the systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development. Mainstreaming Disaster Risk Reduction describes a process to fully incorporate disaster risk reduction in the infrastructure development policy and practice.

Disaster reduction policies therefore have two fold aims: “to be resilient to natural hazards while ensuring that development efforts do not increase vulnerability to these hazards.”

As shown, development of a typical infrastructure project in DPWH follows a cyclic process consisting of four phases: Project identification, Project preparation, Project implementation and Project operation and evaluation.



After the projects are identified, **feasibility studies** are conducted which includes investigations and analysis to determine the extent and degree of desirability of a project against technical, economic, social, environmental, financial and operational aspects. As part of this project, sample feasibility reports over last 20 years were analyzed in terms of content and it was realized that the structure of the report largely depends on the source of funding of the project. Typically due to lack of funding for construction of national road projects, DPWH administers a basic feasibility study, but for foreign-assisted projects the assessment process is more in-depth and extensive. However, it was noted that post 2000, the feasibility reports do tend to include a section on “Review of hazard specific threats on road sections” though it is primarily limited to protecting the road segments from geological hazards such as landslides and debris fall. In addition, DPWH feasibility study includes an **Environmental Impact Assessment (EIA)**. The EIA report structure considers the impact of hazards by defining an “environmentally critical area” of the project site where it is frequently visited by the natural hazards. However, it does not explicitly

provide details on how to address natural hazard vulnerability and risks to infrastructure and the consequent impact from its damage or failure.

Similarly, **Cost-benefit analysis** cover only the planned use of the facility and does not factor in other costs (risk based cost) arising from potential damage or possible failure of the structure to function to a certain event.

Assessment of damages to roads affected by a natural disaster is carried-out by DPWH at the district level. There is no fixed format followed for collecting information needed for the assessment and the reports are directly sent to NDCC for the preparation of an overall disaster assessment report. Hence, it becomes difficult to trace these records at the regional or central offices of the DPWH. Similarly the damage information of past disasters available from NDCC is in a consolidated form, with limited access to detailed report on damages and their corresponding costs.

Also of equal importance is to **benchmark hazard intensities with their Return periods/Damages**. This is particularly difficult due to lack of updated topographic maps at 1:5,000 or higher resolution, a sparse network of hazard monitoring stations (seismic and flood) as well as short monitoring period and limited processed data on hazards. The following key documents were collected during the project to conduct the analysis:

- Standard Terms of Reference



for Strategic Environment Assessment for Plans and Programs

- Standard Report Format for Strategic Environment Assessment for Plans and Programs
- Sample of Damage Report DPWH District Office
- Sample of Consolidated Damage Report by NDCC
- Sample of Bridge condition Inspection Form
- Sample of Pre- Feasibility and Feasibility Reports of Road projects starting 1984
- List of future projects of DPWH

It is also realized that since mainstreaming of disaster risk reduction involves a broad range of stakeholders, interrelated plans and programs, disaster risk reduction concerns need to be ***linked with ongoing projects*** of DPWH such as:

- The earthquake rehabilitation program and similar seismic vulnerability assessments
- DPWH National Roads Improvement and Management Program, Phase II
- DPWH Road Maintenance Investment programs
- The study on the nationwide flood risk assessment and the flood mitigation plan for the selected areas in the Philippines
- Technical Assistance for risk assessment and management
- Benefit monitoring and evaluation of selected roads, Phase II, ADB Capacity Building
- Study on risk management for sediment related disaster on selected national highways
- Similarly close linkage needs to be established with the ongoing project of NDCC in partnership with UNDP on Hazard Mapping and Assessment for effective community-based disaster risk management (READY).

IDENTIFIED CHALLENGES IN DPWH

- The risk assessment process of the foreign-assisted projects is more in-depth and extensive compared to the locally-funded (national government funding). Thus the need to standardize the process was identified.
- There exist a “gap” in conforming to recommended standards used in the actual implementation of roads and bridge construction.
- The infrastructure damage reports following a natural disaster submitted by the DPWH District Offices to Office of Civil Defense (OCD) are already consolidated; hence efforts to review past damages are limited.
- Record keeping of submission by DPWH central office on past damages following natural disasters is a problem. Hence, reconciling damage reports from OCD and DPWH is a tedious process.
- Further investigations are passed on during detailed engineering stages. The costs of these investigations may not have been included in the financial proposals.
- The present inventory of damages and information on hazard may poorly establish relationships among variables as hazard magnitude, return period and resulting damage.
- Flood impact assessments were not normally considered in feasibility studies for road projects due lack of funds/resources.
- Disaster assessments focused more on impacts of road-slope hazards (ex. Cut-slope failure, landslide, debris flow, rock fall, embankment slope failures)
- Due to limited funds, DPWH goes about with basic feasibility study and then in subsequence phases, as and when required, disaster risk reduction concerns are incorporated in the project implementation.
- Hydrologic data collection (specifically stream flow) is available for major basins, but apparently, is not processed to provide useful information like

finding relationships between flow/stage and their corresponding return periods.

- Inventory on roads and bridges is maintained at the central level of DPWH but this does not include damage data related to natural disasters.
- Information on damages to roads and bridges from natural hazard events are prepared at the district level; however, different formats are used to report them.

IN CONCLUSION, THE KEY FINDINGS ARE:

- DPWH adopts a basic “one size fits all” format for feasibility studies of road projects that does not specifically require assessment of disaster risks. During detailed design, disaster risk reduction aspects are incorporated into the project if required.
- Mostly national budgets do not provide funds for surveys and investigations at the feasibility study stage, and it is therefore unusual for disaster risk reduction measures to be incorporated at early stages of project preparation.
- Externally funded projects are prepared to higher standards, particularly in relation to environmental assessments (where disaster risk aspects are described if required by the particular agency) and resettlement planning.
- There is uneven application of building codes and design standards between national and local roads.
- Absence of one fixed format for collecting information on damage to roads and bridges from natural hazards prepared by district-level offices.
- Hydrological data are available for major river basins in the Philippines but these information have not uniformly been processed to provide flow/stage relationships for different return periods, which could be used for road design.

The key to successful integration of disaster risk reduction on road projects lies in the planning phase...

In order to take forward the momentum gained under the PIP, the technical working group has identified the following next steps to realize the recommendations:

- Identifying two pipeline road projects in a hazard prone area of the Philippines. The two projects would be at different stages namely a pipeline project without a feasibility study and a pipeline project with a feasibility study completed.



- Integrating disaster risk reduction (DRR) into the planning process of two identified pipeline project.
- Capacity building of officials from DPWH responsible for conducting feasibility studies on how to integrate DRR.

Recommendations

- DPWH needs to have a standard on project identification and preparation procedures to eliminate quality discrepancies between nationally and externally funded projects and to pave the way for mainstreaming disaster risk reduction in road projects.
- Feasibility reports should include assessments of the impact of potential disasters.
- An enhanced natural hazard/impact assessment component should be included in the EIA for nationally-funded and foreign-assisted projects
- The existing system for monitoring road needs to be improved to allow for the recording of damage caused by natural disasters.

- Standard formats and reporting standards should be introduced for monitoring and for collecting damage data from the impact of natural disasters on roads.
- Capacity of staff to assess the impact of natural disasters needs to be increased, particularly at the regional and district levels.

Next Steps for mainstreaming disaster risk reduction into road sector in the Philippines

The key to successful integration of disaster risk reduction on road projects lies in the planning phase of the project cycle which includes project identification and preparation of the feasibility study.

Assessing the possible impact on the project of natural disasters or other hazards at this stage means that the appropriate risk reduction measures can be included in the scope, layout and arrangement of the project's major components—and that these measures will be allowed for in the cost estimate. If such measures are not included at the planning phase, their inclusion at the later stages is unlikely, or could be costly and inconvenient (i.e. possibly requiring a supplementary budget). Attempting to include risk reduction measures at the design stage (after major elements of the project have been decided and the budget has been allocated) cannot adequately satisfy the need for disaster risk reduction.

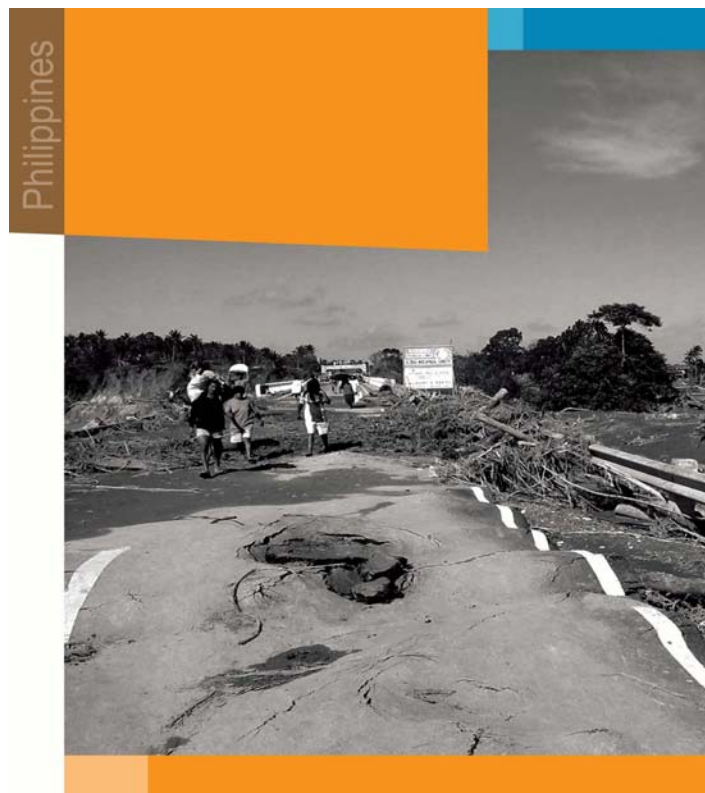
Therefore, Mainstreaming Disaster Risk Reduction will aid DPWH to further:

Define entry points and develop tools to operationalize policy and integrate disaster reduction into all areas by:

- Developing targeted disaster reduction projects (future projects)
- Incorporating vulnerability and risk reduction indicators into the natural hazards impact assessment (for the structure and the consequent human impact in feasibility studies)
- Incorporating site selection screens and natural hazards identification and assessment in the EIA in local projects.

- Incorporating Disaster Risk Management in project development cycle
- Developing human resources capacity (ex. Logistical support to conduct vulnerability assessment)

Develop performance targets and indicators to help integrate and expand disaster risk reduction initiatives into project development, planning and programming within DPWH.



Use the performance targets and indicator systems to guide DPWH assess, measure and monitor their progress with mainstreaming risk reduction efforts.

